

# The Solution Mining Research Institute (SMRI) Contemporary Research Projects

Pipeline Research and Development  
Forum

Washington, DC

December 11-12, 2003

[www.solutionmining.org](http://www.solutionmining.org)



# SMRI History

- Brine Cavity Research Group formed in 1959
  - 11 companies
- SMRI, Inc. formed in 1965
- Membership today
  - 44 US - 49 European - 8 other areas
  - 22 brine producers, 33 storage companies, 26 service /consulting companies, 23 consultants/educators/govt labs
  - 1 regulator



# SMRI Organization

- Four Employees
  - Executive Director
  - Assistant Executive Director
  - European Coordinator
  - Research Coordinator
- Annual budget ~ \$250,000

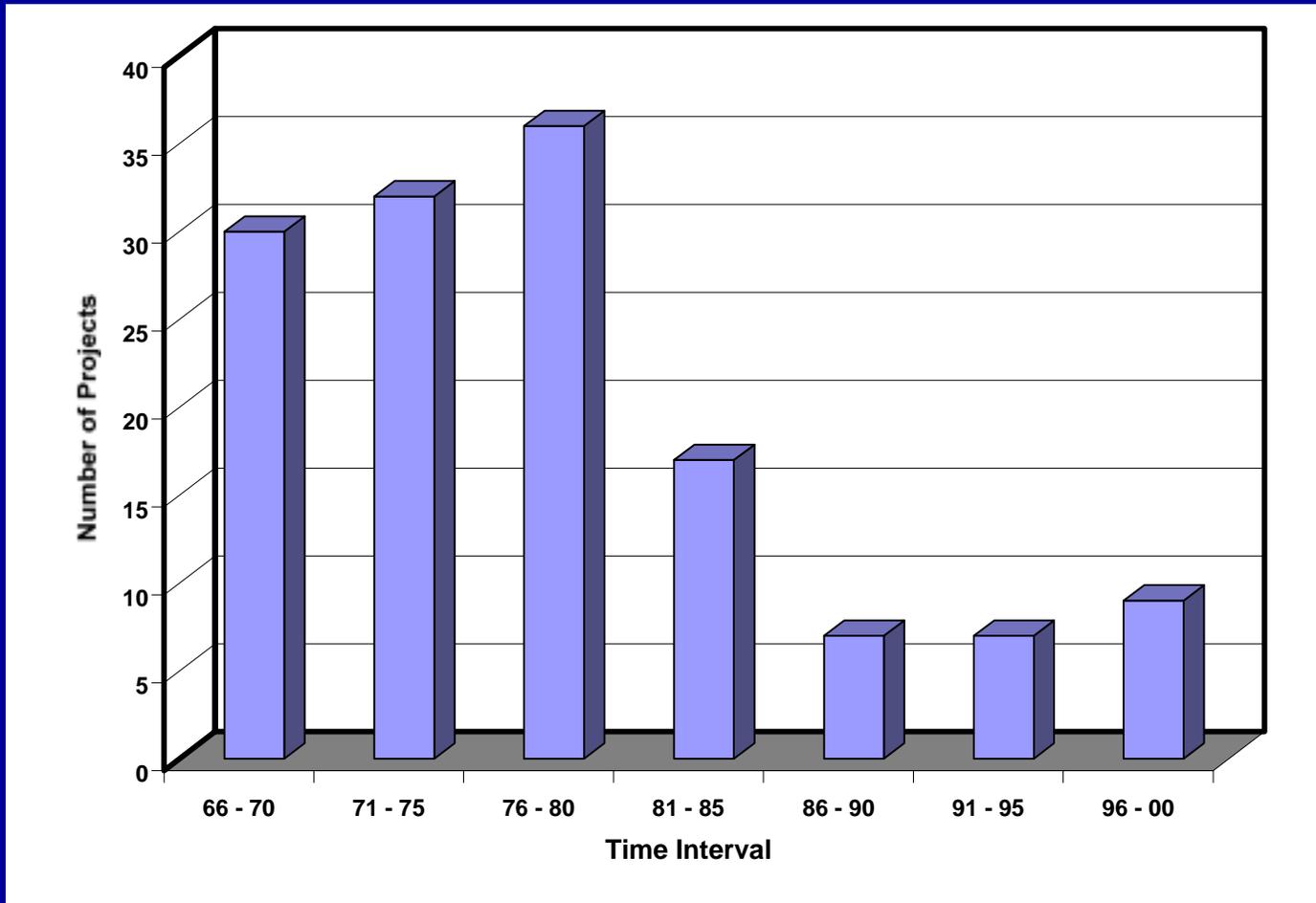


# SMRI Historic Research Activities

- Solution Mining (physics and modeling)
  - 35% of all projects
  - SalGas software
- Subsidence
  - 18% of all projects
  - Salt Subsid software
- Geomechanics
  - 10% of all projects



# SMRI Research Projects



# Contemporary Projects

- State-of-the-Art Reviews
  - Gas Cavern MITs
  - Brine Corrosion
  - Hydrate Formation
- Technology Manuals
  - Locating Abandoned Wells
  - Cavern Seals
- Multi-Project Programs – Cavern Sealing & Abandonment



# New RFPs

- Mechanical Integrity Tests for Gas and Liquid Caverns
- Cavern Sealing & Abandonment Field Test
- Cavern Shut-in Data Collection
- Cavern Sealing Technology Manual
- Sealing and Abandonment Issues in Bedded Salt Caverns



# Example SMRI Research Project

## Cavern Sealing and Abandonment

A multi-contract Research Program



# The SMRI CS&A Program

- CS&A Advisory Committee
  - Operators, Researchers, Regulators
- Program Researchers
  - GdF, Ecole Polytechnique, RESPEC, University of Hannover, KBB, Professor John Stormont, IbeWa
- Program Completion and final report in 2002

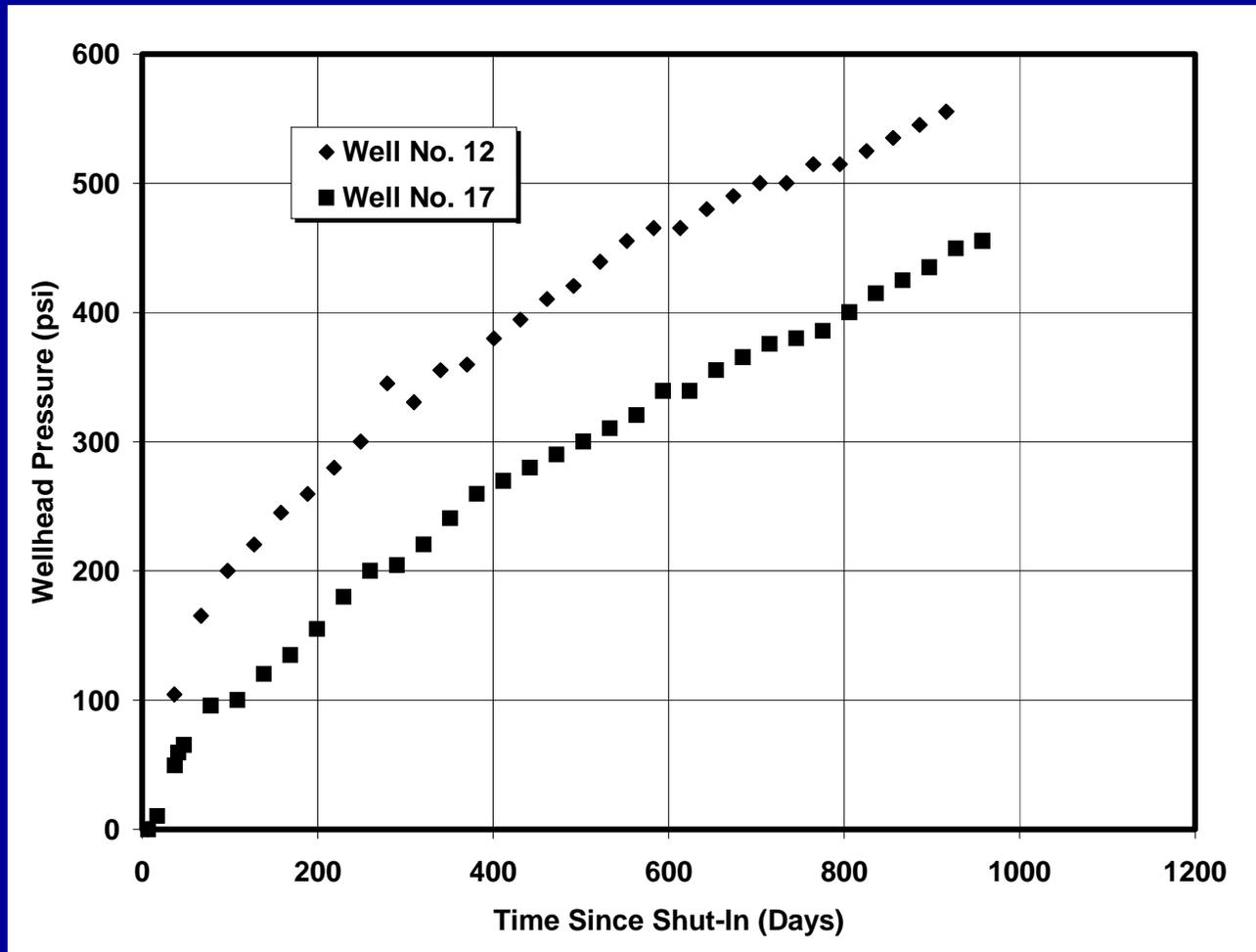


# Why are cavern wells different than O&G Wells?

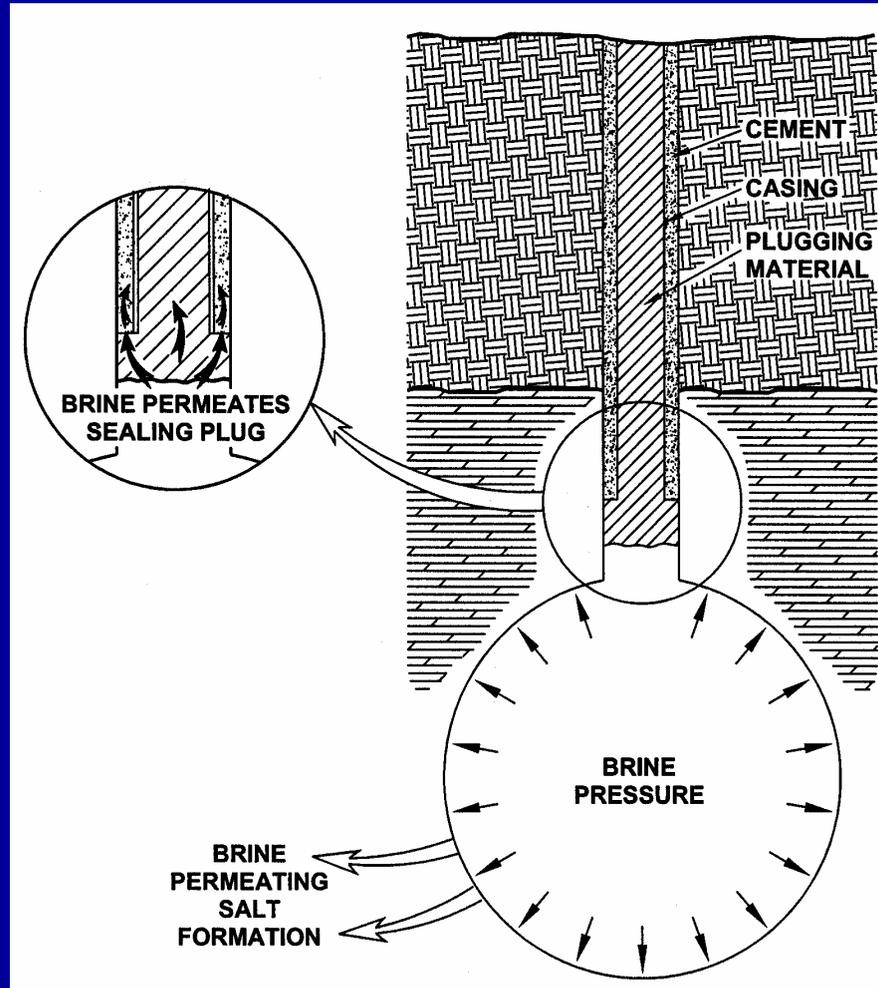
- Cavern wells have much larger casings than oil and gas wells
- Cavern fluid pressure rises after well plugging



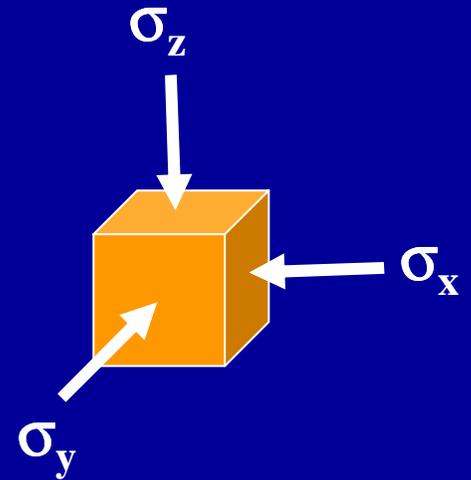
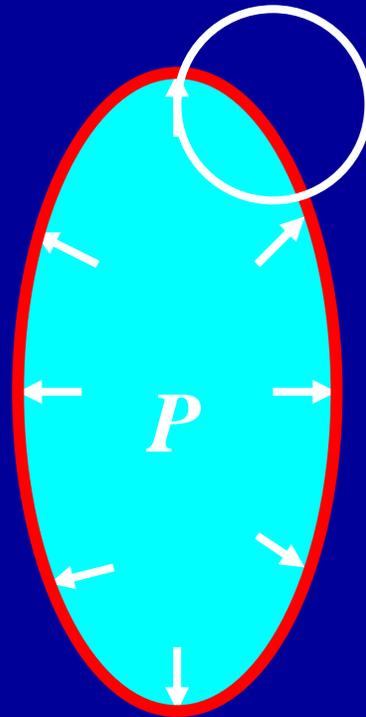
# Typical Sealed Cavern Pressures



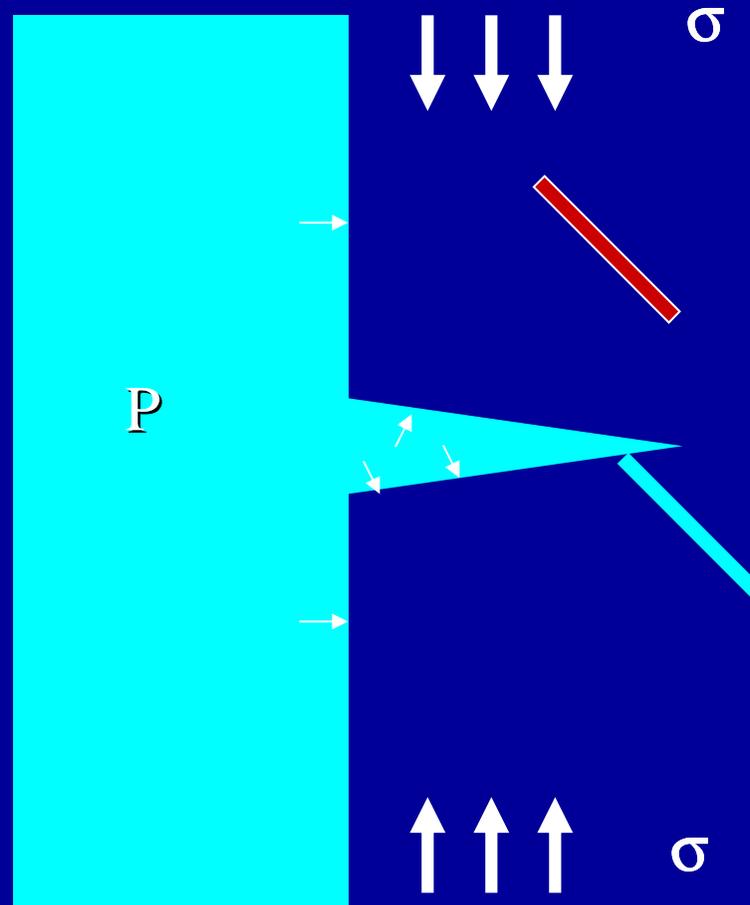
# Cavern Leak Paths



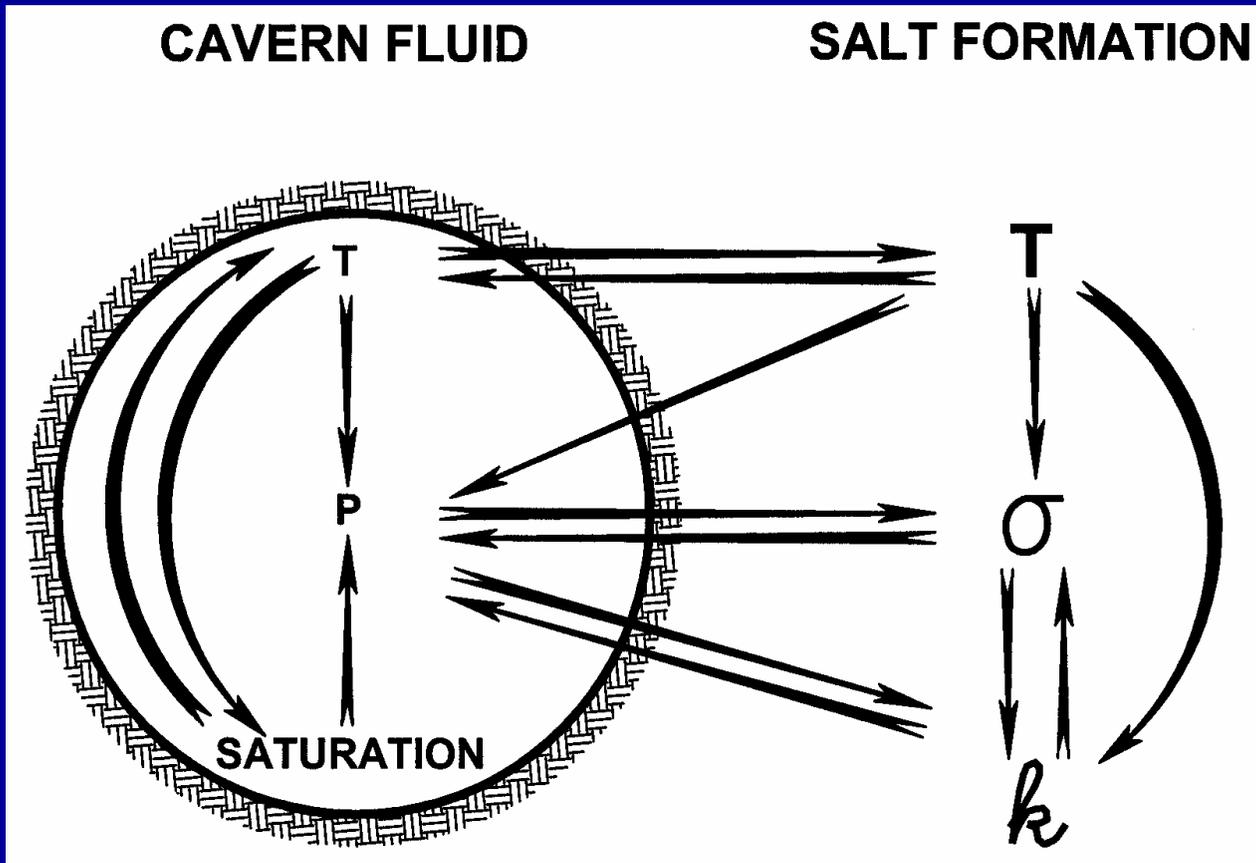
# The Sealed Cavern Paradigm



# The Complex Sealed Cavern



# Complex Coupling in CS&A

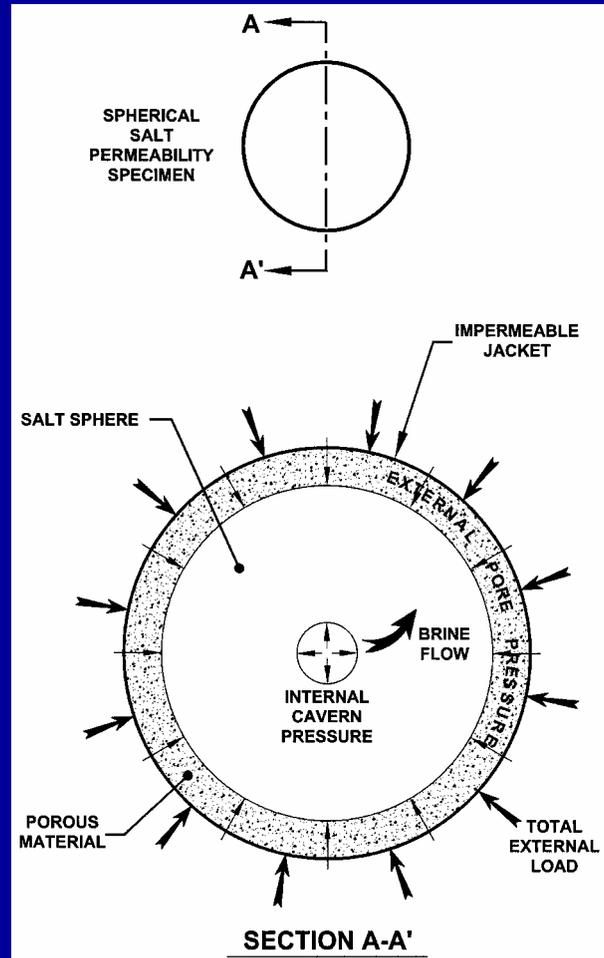


# SMRI Program

- State-of-the-art bibliography compilation
- Salt permeability testing ( and expert review of results)
- Bench-scale casing shoe testing
- Geomechanical modeling
- Acquisition of cavern pressurization field test results



# Ecole Polytechnique Permeability Tests



# *RESPEC* Bench-Scale Casing Shoe



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# SMRI Contact Information

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